

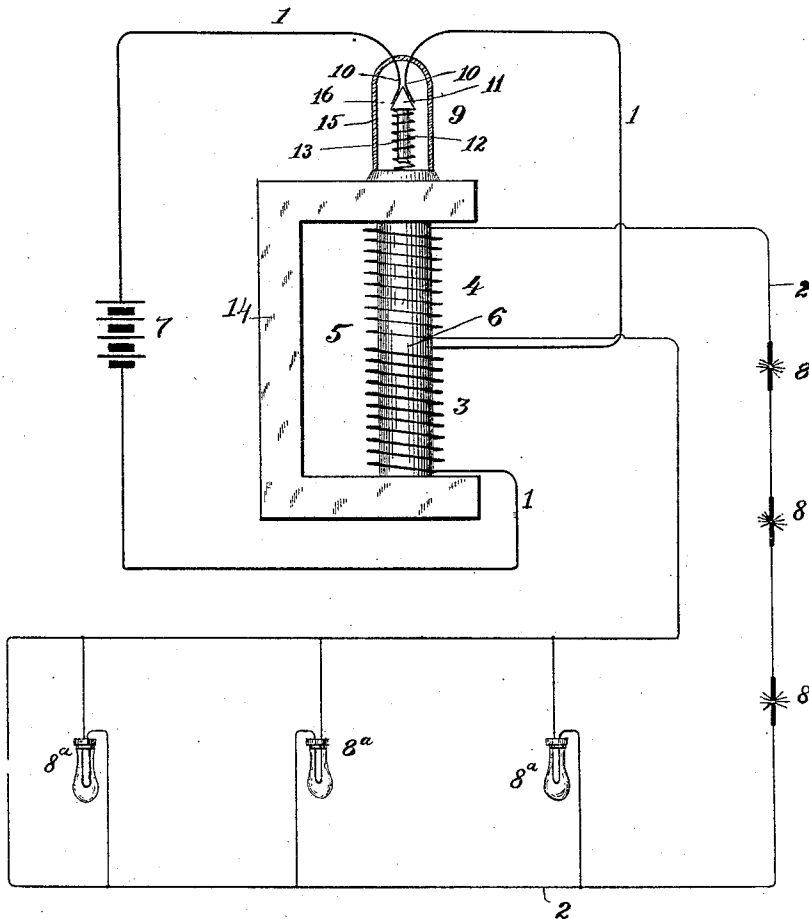
(No Model.)

O. A. ENHOLM.

DEVICE FOR TRANSFORMING AND CONTROLLING ELECTRIC CURRENTS.

No. 441,542.

Patented Nov. 25, 1890.



Witnesses

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UNITED STATES PATENT OFFICE.

OSCAR A. ENHOLM, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF SIX-TENTHS TO JULIUS M. HEYMAN, GEORGE W. VENABLE, AND MOSES J. HEYMAN, ALL OF SAME PLACE.

DEVICE FOR TRANSFORMING AND CONTROLLING ELECTRIC CURRENTS.

SPECIFICATION forming part of Letters Patent No. 441,542, dated November 25, 1890.

Application filed February 20, 1890. Serial No. 341,125. (No model.)

To all whom it may concern:

Be it known that I, OSCAR AXEL ENHOLM, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Devices for Transforming and Controlling Electric Currents, of which the following is a specification.

My invention relates, mainly, to a system and apparatus for producing an alternating current in a circuit containing translating devices by induction from a pulsatory or intermittent current. This I do by supplying the primary or inducing circuit from a source of constant current and causing the same to be broken intermittently at the transformer by an automatic electro-magnetic rheotome. The difficulty which has attended the use of such a system is the destructive sparking which takes place between the terminals of the automatic rheotome. With the large currents necessary for commercial purposes—such as electric lighting—this sparking gives rise to an arc which is maintained until the circuit-breaker is destroyed. To obviate this I cause the primary circuit to be broken in a vacuum between solid conducting-electrodes. This is found to prevent sparking and enables the automatic rheotome to be used with currents of great energy without injury to the terminals.

Other advantages of this improved circuit-breaker, in connection with inductive coils generally, is that by shortening or sharpening the break it increases the electro-motive force set up in the secondary by the break in the primary circuit.

That part of my invention which relates to placing the terminals in a vacuum is of utility in connection with circuit-breakers generally, and I do not limit myself to the particular application of it here shown.

Referring to the accompanying drawing, which forms a part of this specification, the figure therein shown is a diagrammatic view of a lighting system with a transformer constructed according to my invention.

The primary circuit 1 and secondary circuit 2 include, respectively, the primary and

secondary coils 3 4 of the transformer, converter, or induction coil 5. The said coils 3 4 are preferably wound side by side on a common core 6. The primary circuit includes any suitable source of constant or continuous current 7, and the secondary circuit includes any desired form of translating devices, such as are lamps 8 and incandescent lamps 8^a.

In order to generate a current in the secondary circuit, the primary circuit is rapidly and intermittently interrupted by an automatic rheotome 9. This is shown as consisting of terminals 10, arranged at an angle to each other in the primary circuit, an annular bridge or contact piece 11, to connect and disconnect such terminals by wedging between them and an electro-magnetic operating device which comprises an armature 12, attached to said contact-piece and adapted to be attracted by the core of the converter when the same is energized, and a spiral-spring support 13, which rests on the floor of the casing 15 and tends to throw the bridge-piece into contact.

In operation the passage of the primary current causes magnetization of the core, attraction of the armature, and interruption of the primary circuit. The core is then demagnetized, the armature retracted, and the primary circuit re-established. Thus a rapidly-intermittent current is caused to pass in the primary circuit, and this gives rise to an alternating current in the secondary, the intensity and electro-motive force of which may be varied, as desired, by suitably proportioning the primary and secondary coils.

The frame-piece 14 of the transformer may be non-magnetic, or it may be of iron, so as to make a closed core, the armature 12 being then actuated by the slight leakage induction across the air-space from one pole to the other.

To prevent sparking between the contacts 10 11 in the primary circuit, I inclose them within the shell or casing 15, from which the air has been exhausted, so as to form a vacuum-chamber 16. This chamber also contains the armature 12 and its retracting-spring, so that no communication with any

external operating devices is necessary, and the chamber may be hermetically sealed. As shown, the casing 15 may also serve as support for the terminals 10, and the shell in turn is supported by and secured to the frame over the end of the core 6.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

- 10 1. The combination, with the core and the primary and secondary circuits, each having a coil, of the frame 14, connecting the ends of said core, a vacuum-case supported on said frame, the terminals 10 of the primary circuit arranged at an angle to each other in
15 said case, an armature having a bridge-piece 11, adapted to contact with said terminals, and a spiral spring bearing upon the floor of said case and surrounding and supporting

said armature for closing the primary circuit, 20 substantially as set forth.

2. The combination, with the core, the primary circuit and coil, and the secondary circuit and coil, of the magnetic frame-piece 14, connecting both ends of the coil, a vacuum- 25 case secured to said frame over the end of the core, the terminals 10, arranged at an angle in said case, an armature having a wedge-shaped bridge-piece arranged to connect said terminals, and a spiral spring resting upon 30 the floor of the casing and bearing against said bridge-piece for closing the primary circuit, substantially as set forth.

OSCAR A. ENHOLM.

Witnesses:

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